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DRAIN FITTING

The present invention relates to an improved drain fitting for installation at a drain inlet emptying into a sewer. Normally, the fitting is closed to prevent the unpleasant odour from entering a house through the drains and is automatically opened when the accumulation of waste water rises to a predetermined value to discharge the waste into the sewer.

Known fittings of this kind are exemplified by U.K. Patent 314569 and U.K. Patent 317829. In the former a flap closing the open, lower end of a seat member is pivoted on a pivot axis running along a chord of the valve seat member and is divided by the axis into two parts, one part being much heavier than the other thereby allowing a closing of the fitting by forces of gravitation and opening only when the accumulation at its upstream reaches a predetermined weight. However, by closing the opening with the whole flap its pivot joint is directly exposed to the drain wash and therefore suffers severe corrosion which considerably shortens its life. In U.K. Patent 317829 only a major part of, but not the whole flap is used to close the opening, and the pivot joint is shielded behind the opening by a half-dome structure which defines an internal space to receive the heavier second part of the flap in its open position. This does remedy the drawback of the former but it is not altogether satisfactory. The half-domed structure in the pipe line is hostile to a smooth flow from the viewpoint of fluid dynamics and solid foulds tend to accumulate. Also its relatively bulky awkward structure occupies more space.

French Specification 551160 discloses a conically tapered seat member with a pivoted flap not exposed to the waste but the flap is not designed and mounted to fit merely in the space behind the tapered side but requires additional space so that the fitting is not suitable for use in a cylindrical pipe of conventional size.

An object of the present invention is to provide an

improved drain fitting which obviates or mitigates the above mentioned disadvantages.

Accordingly, the present invention provides a drain fitting which is normally closed and only opens when the weight of the accumulation of waste upstream thereof reaches a predetermined level comprising:

a slotted plate mounted at the top of a seat member having an opening at its lower end, the seat member being substantially cylindrical apart from a substantially planar portion which slopes downwardly and inwardly from adjacent the top to the bottom thereof, the portion defining a space which is not in communication with the interior of the seat member when it is closed,

a flap pivotally mounted on said seat member for movement between an open position and a closed position and divided by its pivot axis into two parts a first part which can sealingly close the opening in the closed position and a relatively heavy second part which normally gravitationally urges the first part to the closed position,

the flap being such that when an accumulation of fluid in the seat member reaches a predetermined weight it will be pushed to its open position to allow the discharge of the accumulation through the opening,

the space being capable of receiving the second part of the flap in its open position without extending substantially beyond an imaginary cylinder coaxial with the seat member and extending through the upper end of the seat member.

The resulting structure is compact and provides a smooth running drainage channel.

Preferably the fitting additionally comprises an outer sleeve which can be permanently fixed in the pipeline and in which the seat member can be nested in a detachable manner.

An embodiment of drain fitting, in accordance with the invention, will now be described by way of example only,

with reference to the accompanying drawings of which:-

Figure 1 is a fragmentary view of a drain fitting, and

Figure 2 is a sectional view of the fitting in a drain pipe.

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With reference to the drawings a drain fitting comprises a slotted plate 1 fitted on to the top of a seat member 2 which is substantially cylindrical except for a substantially planar portion 3 which slopes downwardly and inwardly from adjacent the top to the bottom of the seat member. The lower end of the seat member defines an opening which is normally closed by a valve flap 6 pivotally mounted on the seat member by a pivot pin 5 so that it is pivotable between an open position and a closed position. The valve flap is divided by the pivot axis into two parts a first of which can sealingly close the opening and the second of which is provided with apertures which receive projections on a weighted member 7 so that the second part is relatively heavy and urges the first part under gravitational force to the closed position. The upper surface of the flap is formed with protruding ringlets 66 for receiving the pivot pin and the lower portion of the seat member is provided with integrally formed eyelets 4 for receiving the pivot pin.

The slotted plate 1 is dished slightly downwardly and is provided with a plurality of slots 11 which are vortically arranged to facilitate the discharge through these slots. In this embodiment each slot 11 has one side 11A of which the curvature is larger than the other side 11B and the height of the former is lower than the latter thereby causing a clockwise whirlpool to accelerate the removal of waste water.

The sloped portion 3 defines a space 21 therebehind which is not in communication with the interior of the seat member when in a closed state and which accommodates the weighted side of the valve flap in the open position without projecting beyond an imaginary cylinder coaxial with the seat member and extending through the upper edge of the seat

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member.

The seat member 2 can be threadedly or resiliently fitted in an outer sleeve member 8 which is permanently fixed in the pipeline, in a sealing yet detachable manner so that it can be dismantled for cleaning. Preferably the seat member is formed by a hard yet slightly resilient plastics material to ensure a better sealing.

With this arrangement the structure is simple and easy to manufacture and assemble and therefore relatively cheap, the hinge joint is not in direct contact with the waste water thus prolonging its duration of life, the structure is compact and can thus fit in a conventionally sized cylindrical pipe and the flow of water through the fitting is fast and unhindered by the shape of the fitting so that solid wastes do not accumulate in the fitting.

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**CLAIMS**

1. A drain fitting which is normally closed and only opens when the weight of the accumulation of waste upstream thereof reaches a predetermined level comprising:

5 a slotted plate mounted at the top of a seat member having an opening at its lower end, the seat member being substantially cylindrical apart from a substantially planar portion which slopes downwardly and inwardly from adjacent the top to the bottom thereof, the portion defining a space
10 which is not in communication with the interior of the seat member when it is closed,

a flap pivotally mounted on said seat member for movement between an open position and a closed position and divided by its pivot axis into two parts a first part which
15 can sealingly close the opening in the closed position and a relatively heavy second part which normally gravitationally urges the first part to the closed position,

the flap being such that when an accumulation of fluid above it reaches a predetermined weight it will be
20 pushed to its open position to allow the discharge of the accumulation through the opening,

the space being capable of receiving the second part of the flap in its open position without extending substantially beyond an imaginary cylinder coaxial with the
25 seat member and extending through the upper end of the seat member.

2. A drain fitting ^{according to claim 1} including a sleeve member which can be fixed in the pipeline of a drain and into which the seat member can be nested in a detachable manner.

30 3. A drain fitting according to Claim 1 or Claim 2 in which the slotted plate is provided with a plurality of vortically arranged slots and is dished downwardly.

35 4. A drain fitting according to any of Claims 1 to 3 in which each of the slots in the plate has two curved sides, one of which has a larger curvature than the other and is at a level lower than that of the other.



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5. A drain fitting according to any of Claims 1 to 4 in which the lower part of the seat member is provided with integrally formed eyelets for receiving a pivot pin of the flap.

5 6. A drain fitting according to any of Claims 1 to 5 in which the flap is provided with integrally formed protruding ringlets for receiving a pivot pin.

7. A drain fitting according to any of Claims 1 to 6 in which the second part of the flap is provided with 10 apertures for attachment of a weight.

8. A drain inlet fitting substantially as described herein with reference to or as illustrated in the accompanying drawings.

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